

Center for Advanced Fluid Dynamics Applications

A national center to facilitate collaborative ventures in advanced fluid dynamics research and applications

The Center for Advanced Fluid Dynamics Applications (CAFDA) is a three-way partnership among Lawrence Livermore National Laboratory, universities, and industry. Its purpose is to develop technology for a wide variety of fluid dynamics problems.

Breadth of resources and capabilities

CAFDA researchers have access to state-of-the-art computational resources and experimental facilities such as the stratified flow facility, the world's largest stratified wind tunnel. Nova, the world's most powerful laser, is used to conduct fluid dynamics research at high temperatures and densities. A gas gun facility is used for experiments involving strong shocks.

Over the years, we have developed extensive capabilities in modeling and analysis, codes and computing, experimental procedures, and engineering design to support our research and development.

Areas of expertise

CAFDA seeks to identify important national technical issues in fluid dynamics and to

develop technology for new applications. Our research strengths in fluid dynamics include:

- Computational algorithms
- Compressible flow
- Mixing and turbulence
- Fluid instabilities
- Coupled thermodynamic-fluid behavior
- Shock waves
- Climate modeling
- Porous flow.

Solving problems

To facilitate the collaboration process, we maintain a database of Livermore researchers and their fluid dynamics specialties. A distinguished external advisory committee keeps us in touch with universities, government laboratories, and industrial participants across the country, facilitating the formation of multi-institution collaborations that can bring greater effort to bear on difficult problems. CAFDA also organizes workshops and seminars, and sponsors visiting industrial and academic scientists and engineers.

Availability: CAFDA is operational now. We welcome the opportunity to work with new partners.

Contact

Rose McCallen or Paul Miller

Phone: (510) 423-7003

Fax: (510) 423-0925

E-mail: cafda@llnl.gov

Mail code: L-022

APPLICATIONS

- Simulating flows around blunt objects
- Tracking pollutant dispersal around buildings
- Evaluating bridge piling wear from water currents
- Enhancing high-speed maneuverability of undersea vehicles